CASAE 20

SUPPLÉMENT
AUX ANNALES DU SERVICE DES ANTIQUITÉS

CAHIER N° 20

THE SALVAGE OF PHILAE

BY

OSMAN R. ROSTEM

Le Caire

IMPRIMERIE DE L'INSTITUT FRANÇAIS D'ARCHÉOLOGIE ORIENTALE

MCMLV

جبل الجرانيت
GEBEL EL GRANITE

سكنات موظفي الخزان
Aswan Reservoir Colony

خزان اسوان
ASWAN DAM

مقياس النيل
Nilometer

جزيرة شاش

جبل طابية الشيخ
G. TABYET El SHEIKH

طابية فديجه

نجع جزيرة عواض الغربي

نجع جزيرة عواض الشرقي

جزيرة عواض
Gez. Auwad

حوض الخزان
Hod el-Khazzan

جزائر بيجه
Gazayir Biga

جزيرة فيله
قصر ايزيس والوجود
مقياس النيل
PHILÆ ISLAND

نجع بيجه
Nag Biga

نجع الغابه
Nag el-Ghaba

نجع الخور
Nag el-Khor

خريرة الهيشة
Gez. el-Hisha

نجع حجار
Nag Haggar

نجع المشهد البحري

نجع المشهد القبلي

سكة حديد اسوان

خور ام بويرات
Khor Umm Buweirat

كورنتينة
Quarantine

محطة الشلال
EL SHALLAL STA.

جبل الدريسة
GEBEL EL DIRISA

مرسى البوسة السودانية

محطة الشلال

سكن موظفي البوستة
سكن موظفي السكة الحديد
مخازن عامة
مدرسة ابتدائية
سوق الشلال

نجع المحطه
Nag el-Mahatta

نجع أبتكول
Nag Abtikul

نجع حفير
Nag Hafir

نجع الجوانى
Nag el-Guwani

نجع الباب القبلى
Nag el-Bab el-Qibli

N.B.
---------- CASE I Complete Submersion R.L. 121.00 M.
—·—·—·— CASE II Partial Submersion R.L. 108.00 M.
..... Natural Bank of the River

Map of the District. (Scale : 1/15.000.)

THE
SALVAGE OF PHILAE

COLLÈGE DE FRANCE
ÉGYPTOLOGIE

INVENTAIRE B 8717 . . . . XO

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INTRODUCTION

A problem, for which the authorities studying the project of the Aswan dam (in 1894) had to find a solution, was raised by the existence of the island of Philae in the midst of the reservoir—what must be done with the temples of Philae if submersion of the island could not be avoided?

Three alternative solutions were proposed by three eminent authorities. Sir William Garstin, in his review (1894) of the report of the Technical Commission of the Aswan Reservoir wrote as follows :

« The Government of Egypt must . . . . . decide either to construct a single dam at Aswan or to postpone the question altogether until that portion of the river lying to the south of the present Egyptian frontier has been thoroughly explored and studied. If its decision be in favour of the former solution, it must also decide as to what is to become of the Philae Temple. As regards this part of the question, I have little to add to the opinion I expressed on the subject in my previous note. When I wrote my first report I thought and hoped that possible alternative sites existed, but the report of Messrs. Baker and Toricelli clearly shows that such is not the case, and that the dam, if made, can only be made at Aswan. This narrows the question to very small limits, and leaves the Egyptian Government face to face with the problem as to what to be done with Philae.»

« If the dam be made at Aswan the Temple must either be Raised, Removed or Submerged. I have already suggested its removal to the island of Biga, Sir Benjamin Baker suggests raising it to such a height as to place it above the level of the highest flood water. Mr. Somers Clarke, the well known archaeologist, has suggested a third alternative (solution). This is, that if it be decided to leave the temple where it is—which in the case of the dam being made would result in its annual submersion—a complete archaeological survey and investigation be made of Nubia, and that accurate drawings and surveys should be made of all relics of interest as would be submerged by the reservoir that

such of these monuments as would bear transporting should be transported to the Cairo Museum, so that if the submersion of these remains should be decided upon as unavoidable, as much should be done as lay in our power to record them and preserve their interesting features from obliteration [1].»

Fortunately it was decided «to leave the temple where it was.» Now after 50 years of annual submersion we have learnt that, from all points of view, this proposal, suggested by Somers Clarke, was the most advantageous. The Aswan dam was built on the most suitable site from the engineering point of view. The complete archaeological survey and investigation of Nubia was made. The Archaeological sites were surveyed and the temples were consolidated, and a series of most valuable volumes, which record and preserve the «interesting features» of the submerged monuments of Nubia, were published by the Antiquity Department. Lastly—beyond little superficial loss—Philae has come out of its trial of yearly submersion as young as ever. It is true that the reliefs and the inscriptions have lost their colours but the water has washed out all the destructive salts in the stones. The island has lost its picturesque verdure but the river has flattened all the parasitic mud buildings of later periods [2].

The most effective solution to the question of Philae, which was not considered or probably not thought of at the time before building the Aswan dam is the Isolation of the island from the rest of the reservoir by building a series of small dams round it and thus preventing the water from submerging the temples without disturbing them by removal or raising.

It would have been much more convenient and more economical to have had this done during the construction of the great dam. Having work in progress on a large scale in the vicinity would have helped to reduce the total cost if the two projects were considered conjointly before building the Aswan dam. This opportunity, of which advantage

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[1] Sir William Willcocks, *Egyptian Irrigation,* vol. II, p. 685, 3rd Edition.

[2] Lyons, *A Report on the Temple of Philae,* Cairo 1908.

was not taken at that time, has again presented itself in connection with the proposed «High Dam» to be made south of Philae. If this new dam were going to be built our proposal, here presented, should be considered as a part of the project or as an annex to it. There would be no practical difficulty at present in carrying out this work, although the cost would be the chief point of consideration.

The aim of this paper is to show that this solution is practically possible and that the nature of the site presents important facilities which would probably help to reduce the cost to within reasonable limits.

The projects, here presented, are based on preliminary studies and thus could not be more than an outline or a sketch of the final project. This will need exhaustive studies and thorough exploration of the site, which most probably have been or are being made for the project of the «High Dam».

Soundings should be made in the sites proposed for the erection of the isolating dams with the purpose of studying the nature of the rocks, finding out at what depth they can be found and their suitability for the foundations. The question of evaporation should be considered with regard to the regulation and maintenance of the level of the water surrounding the island. Seepage through cracks (if any) existing in the rocks of Biga and the other islands will probably be of no consequence as the annual inundation, during those long years of submersion, might have filled up the cracks with mud and silt. The kind of foundations and their cost will depend on the results of these investigations.

If the government finds that this proposal is worthy of consideration the preparation of the final project should be put in the hands of the competent authorities of the Public Works Ministry.

The scheme : If a map of the site, as it was before building the Aswan dam (fig. 2) were consulted, it would be seen that Philae lies near the east bank of the Nile in a kind of bay. To the west the island of Biga, with the exception of two narrow gaps, almost blocks that bay. By building a series of three dams between Biga and the east bank of the river, filling these gaps, the area containing Philae would be

isolated from the rest of the reservoir, and the water level in the enclosed area, can be kept as low as required to leave Philae above water.

Other archaeological sites, now submerged yearly, will also be left above water. The temple of Biga, which is built on the east of this island, opposite the colonnades of the temples of Philae, the inscriptions on the rocks of Konossos and numerous other inscriptions found in different places all lie within the future enclosed area. The importance of these monuments and inscriptions and their relation to Philae have been pointed out by many Egyptologists.

It may be suggested that the design of the proposed dams should follow that of the existing Aswan Dam. But as this will raise the cost and as the purpose of these dams is different from that of the existing great dam alternative designs based on the latest ideas and methods of construction should be considered and adopted. These may be more economical and easier to construct.

The height of the water in front of a dam is the main factor in the design of its section. The less the height, the less material will be required for the construction, and consequently the cost will be in the same proportion.

The data, so kindly supplied by the Hydrological Service of the P. W. M. in the shape of a contour map (fig. 1) giving the levels of the bed of the Nile arround these islands, show that the dams will be (in the average) of comparatively moderate heights.

The construction of a new gigantic dam to the south of Philae, which is now under consideration by the Egyptian Government, reduces the problem of this island to three alternative cases, depending on the intended height of water to be stored in front of the existing Aswan dam (*i. e.* in the area containing Philae) after building the « High Dam».

These three cases are the following :

1) If the height of the water will remain below R. L. 104, which is the level of the floor in the temple, Philae will not be submerged and there will be no need for the isolation of the island nor of the construction of the here proposed dams for this purpose (fig. 3 *a*).

2) If the present maximum storage height (R. L. 121) is going to

be maintained [1] Philae will be completely submerged and the proposed dams should be built with their top at R. L. 123 (fig. 3 *b*).

3) If the maximum height of storage will be somewhere between R. L. 104 and R. L. 121, Philae will be partly submerged (fig. 3 *c*). In this case the damage to the temple will be imminent and the construction of the isolating dams will be badly needed. Figures 4 and 5 show the kind of damage which may happen to the monuments by partial submersion.

According to the scheme of the new « High Dam» the height of water in front of the Aswan dam (*i. e.* between the two dams and where Philae lies) will be kept at R. L. 108 to give the necessary head of water for the power station now under construction. Thus about 4 metres of the total height of the temple (about 20 metres) will be submerged the whole year round.

In this paper only the two last cases will be discussed.

THE CASE OF COMPLETE SUBMERSION

The present (1955) heighest storage level in the Aswan reservoir is 121 ms. above sea level. As the dam can be raised to R. L. 123, the top of the proposed dams should be at a R. L. not less than 123- say at 125. The levels of the pavements of the temples vary between 103 and 104. Consequently the heighest level of water allowed inside the enclosed area should not be above R. L. 102. Thus the difference of water level in front and at the back of the dams will be about 21 ms. (fig. 3 *b*)

In the deepest parts the greatest thickness of the proposed dams will depend on this difference (21 ms.) and not on the total depth of the water in front of the dams. This is an important factor which will have an economical influence on the design.

The contour map (fig. 1) shows that the bed of the Nile, at the sites chosen for building the dams, is mostly above R. L. 100. The longitudinal sections (figs. 6, 7, 8) show that half of the total length of the

[1] This can be done whether the « High Dam» is going to be built or not.

3 dams (1200 ms.) will be above R. L. 100. This makes the heights of the dams very between a few metres and 25 ms. (average 12 ms.). Below R. L. 100 the height will vary between 25 and 55 ms. (average 40 ms.). But the effective height (*i. e.* the difference between the levels of water in front and at the back of the dams) will not exceed 19 ms. Some parts of the dams will be on dry land at the back (e. g. Dam between points C and D).

The following questions are mentioned as they should be considered in case the storage level of the Aswan dam will be at R. L. 121. After building the « High Dam» the conditions will be changed and there will be no need to consider these questions as here presented.

The amount of water now stored in the future-enclosed area (about 30 millions cubic metres) will not be reduced of the storage capacity of the reservoir (5000 millions cubic metres), because this total depends on the height of the stored water. The result will be an increase of a few cms. in the water level in the most southern regions of the reservoir. This will have no further effect on the temples in that district, which are now submerged.

To avoid the necessity of providing docks to enable the Sudan Steamships to enter the « Philae Basin», the existing railway line can be extended and a new quay can be built in a suitable place outside the basin.

Whether the proposed desert line, to join the Sudan to the Egyptian Railways, will be completed or not, the Steamship Service between Shellal and Halfa should be maintained. This is the only convenient means of communication in that district. Without this the whole country will be deserted, as the railway line will be far inland, while the villages and the ancient monuments of Nubia are all on the bank of the Nile.

THE CASE OF PARTIAL SUBMERSION

This will probably be the case of Philae in the future (*i. e.* after building the « High Dam»), unless the proposed isolating dams would be built. If these dams were to be built the heighest level of water

allowed inside the enclosed area should be, as in the first case, not above R. L. 102. Outside this area the maximum level of water will be at R. L. 108 (as given by P. W. M.). Therefore the top of the dams should be at R. L. 110. The difference between the water levels in front and at the back of the dams will be about 6 ms. This will be the effective height of the dams in the deepest points.

The longitudinal sections (figs. 9, 10, 11) show that in this case one third of the total length of the 3 dams (about 950 ms.) will be above R. L. 100. The heights of the dams vary between a few metres and 10 ms. (average 5 ms.). Below R. L. 100 the height will vary between 10 ms. and 40 ms. (average 25 ms.). The effective height will be only 6 ms.

To regulate the level of water in the enclosed area and to prevent stagnation a sluice should be provided in the southern dam (*i. e.* upstream) to allow fresh water into that area. A pumping station will also be needed to pump out the unwanted water. This can be used for irrigating a reclaimed area of agricultural land which will result from this scheme (see below).

The cost of building these dams cannot be given now. This depends on many factors which will be defined during the preparation of the final project (e. g. the materials to be used, the type of section, the required fondations, the necessary anexes etc.). However, in any case, the cost should not exceed several hundred thousand pounds, if modern methods of construction were adopted.

CONCLUSIONS AND RESULTS

By keeping the water level behind the dams not higher than R. L. 102 Philae will remain surrounded with water, retaining its character as an island and confirming its choice by the Ancient Egyptians as the most fitting site for the temple of Isis [1].

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[1] When Isis was seeking the body of Osiris she left their son Horus under the care of Uazet in the city of Pé built on a floating island in the marshes of the Delta.

The eastern bank of the Nile will return to its natural shape (see map fig. 2). An area of 600 feddans of rich agricultural land, which is now submerged yearly will be reclaimed and ready for plantation. The economical importance of this reclaimed land should not be considered with regard to its nominal value but according to the value of the annual crops to be obtained and to the profit gained by its continued cultivation. Six hundred feddans make a welcome addition to the limited area of agricultural land round Aswan, a region destined to contain settlements of workmen and personnel of the factories which will follow the electrification of the great dams. The loss of arable land in Nubia, which will result of building the « High Dam» would be also partly compensated.

As a result of making Philae accessible the whole year round, especially during winter, the beautiful country round it will become once again a very attractive centre of tourism and a popular winter resort. The ancient monuments of Aswan with its formidable modern monuments, the two great dams, its impressive scenery and its healthy winter climate will be crowned by the appearance of Philae in the right season. Ample space and agreable spots on the adjoining islands or on the main land furnish suitable sites for building hotels and provide fields for sport and attractions beloved by tourists and holiday makers.

The greatness of Pharaonic Egypt was largely due to the Egyptian's respect and devotion to national traditions and to his zealous adherence to the established religious beliefs. These were the doctrines accepted and jealously kept generation after generation.

As the temples were the centres of culture and religion it was natural that the Egyptians considered them as the most sacred strongholds of their civilization. The Pharaohs did their best to manifest the importance of the temples, preserving them by continual reparation and enlarging them by adding new areas. They immortalised their reigns by building new temples.

These were the splendid and divine foundations on which Pharaonic civilization was able to stand unchalenged in amazing brillance and glory, for the long duration of nearly 40 centuries. No other civilization had enjoyed such a long life and prosperity.

At a time when the Egyptians had lost their political power, their culture had won the admiration and respect of their foreign rulers. The Persians, The Greeks and The Romans, in the zenith of their power had adopted Egyptian artistic traditions, repairing and preserving the ancient monuments and glorifying themselves by building new ones in the Egyptian style.

The great achievements of Modern Egypt are growing in remarkable harmony with, and among the eternal relics of Ancient Egypt.

The building of the great dams—the old and the new—and the creation of an industrial region round them are the most important contributions of Modern Egypt to the renaissance of her greatness. Nubia is becoming once more a focus which will attract the interest of the whole civilized world.

The renaissance of Egypt's glory symbolised by her modern monuments will be more appreciated and admired in close cooperation with her historic splendour immortalised by her ancient monuments.

APPENDICES

I) The island of Philae (fig. 13).—The idea of removing or transporting the temples of Philae to a new site should be abandoned. Their artistic and architectural aspect, which was the main factor in choosing their actual site, will certainly suffer by loosing its esthetic splendour. The temples were meant to occupy an island. The high rocks of the adjoining islands form a dark background, which could not be found in any other place. They form one group—the temples are bound together in planning by the shape and outline of the island. It would be a great scandal to shatter this whole by removing one or two of the temples—and removing the entire group is obviously out of the question. Where would be a piece of fine jewellery if its precious stones were picked out and scattered? Philae will be deprived of its fascination and glamour by separating its temples from their enchanting natural setting. The ugliness resulting from re-erecting

them on a high hill or in a place, where modern buildings can be seen (even at a distance), can be easily imagined.

The archaeological significance of the relation between the temples and monuments of Biga and those of Philae was defined by many Egyptologists.

The appearance of the proposed dams in the landscape will have no disagreable effect. This can be easily seen by the photograph (fig. 14) on which the southern dam was added to the same scale.

The practical difficulties of pulling down the buildings and transporting them should not be underestimated. The danger to the stones being chipped and broken into fragments, mutilating the reliefs and disfiguring the inscriptions, can be anticipated. The long time taken to complete a scheme such as this will help to increase these difficulties and augment that danger. Finally the enormous cost to carry out this futile work is alone a sufficient reason to decide against this idea.

II) The monuments of Nubia—Abu Simbel, Wadi Es-Saboa, and all the others, built on the bank of the Nile, are menaced by submersion under the waters of the reservoir in front of the «High Dam» (see fig. 12).

The problem of these monuments, with the exception of Abu Simbel, is simpler than that of Philae. The welfare and prosperity of modern Egypt is certainly of prime importance compared to any other consideration. Most of these monuments were surveyed and subjected to complete studies and were effectively consolidated before building the Aswan dam. As previously stated the results were published in a series of documentary volumes.

Sir William Willcocks once said :

«A great deal of the opposition to the annual inundation of Philae temple for four or five months per annum came from a misapprehension. People confused the damage done by the salty percolation water, which filters up through the soil in flood time and works such havoc at Thebes, with the really preserving effect of the freshly flowing Nile water. One destroys stone, the other conserves it. The retaining walls

of Philae temple, which are annually inundated for six months per annum, are better preserved than any other part of the temple. It is the same with all stone and brickwork on the Nile. The submerged parts are better preserved than the parts which are never submerged»[1].

This is amply proved by the present condition of preservation of the temples of Philae after their annual submersion for many years.

The Antiquity Department should be granted funds to strengthen those monuments in Nubia that need reparation and consolidation and to study and record those that were not published before.

However, the question of removing the temples of Nubia, which are built in stone or at least the most important of them, and re-erecting them on higher places is worthy of consideration. In this case the removal is not objectionable from the esthetic point of view. The temples are built overlooking the Nile on its bank. If they were re-erected on the new high bank of the river they would loose nothing of their characteristic position as it would be in the case of removing Philae. The practical difficulties are almost as disquieting as for the temples of that island. The cost of these operations and the condition of the temples will determine which of them may be left to their fate and which may be transported.

III) Abu Simbel—If Philae have happily subsisted with some hope of solving its problem which occupied the minds of its admirers for half a century—and if transport were a probable solution to the problem of the other monuments of Nubia—the case would be entirely different as regards the rock-cut temples at Abu Simbel.

It is necessary to find out what will be the effect of submersion on these monuments which will be completely and perpetually under water.

There will be no opportunity to inspect them from time to time and examine the effect of the water on the rock. There will be no possibility of repairs if damage occurs.

The problem of what to be done to the temples of Abu Simbel to

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[1] Sir W. William Willcocks, *The Aswan Reservoir and Lake Moeris,* London 1904, p. 27.

protect them from inundation is not an easy one. Yet an investigation on the spot may help to suggest a solution. The height of the cliffs round the monuments, their contour lines, the stretch of land in front of the temples, the nature of the bed of the Nile, and the height of water in the reservoir are the main points to be studied. If a practical and acceptable solution could not be found then these magnificent monuments, unique in the whole world, would be destined to destruction and oblivion forever.

The Antiquities Dpt. should start making an archaeological survey of the site and the temples. A complete record of the inscriptions and a series of plans, sections and elevations of the temples supplemented by photographs, should be published before the temples disappear».

Acknowledgments

My gratitude is due to the Director General of the Antiquities Dept. Professor Mostafa Amer for his interest in this scheme and for his decision to publish my report by his department. I wish also to express my indebtedness to the Director General of the Hydrological Service of the P. W. M. Mr. Youssef Semeika and members of his staff for allowing us to copy the contour map without which the study of the scheme could never have been made. To Mr. Mohamed Awad Raslan, architect of the Antiquities Dept., who copied the contour map and made the drawings and maps included, and to Mr. L.-A. Christophe, who superintended the publication of the report, I offer my sincere thanks.

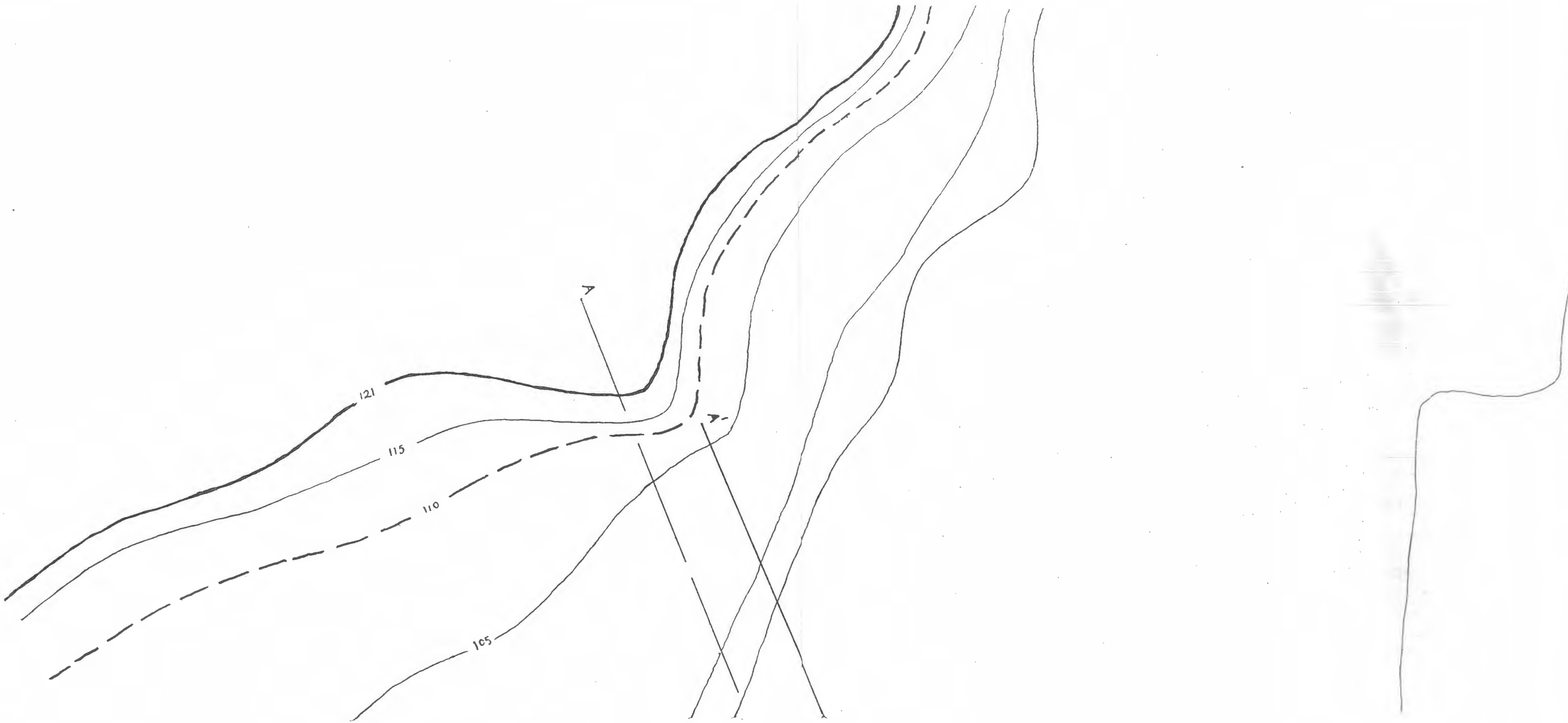


Fig. 1. Secteur A. (Scale : 1/1.900).

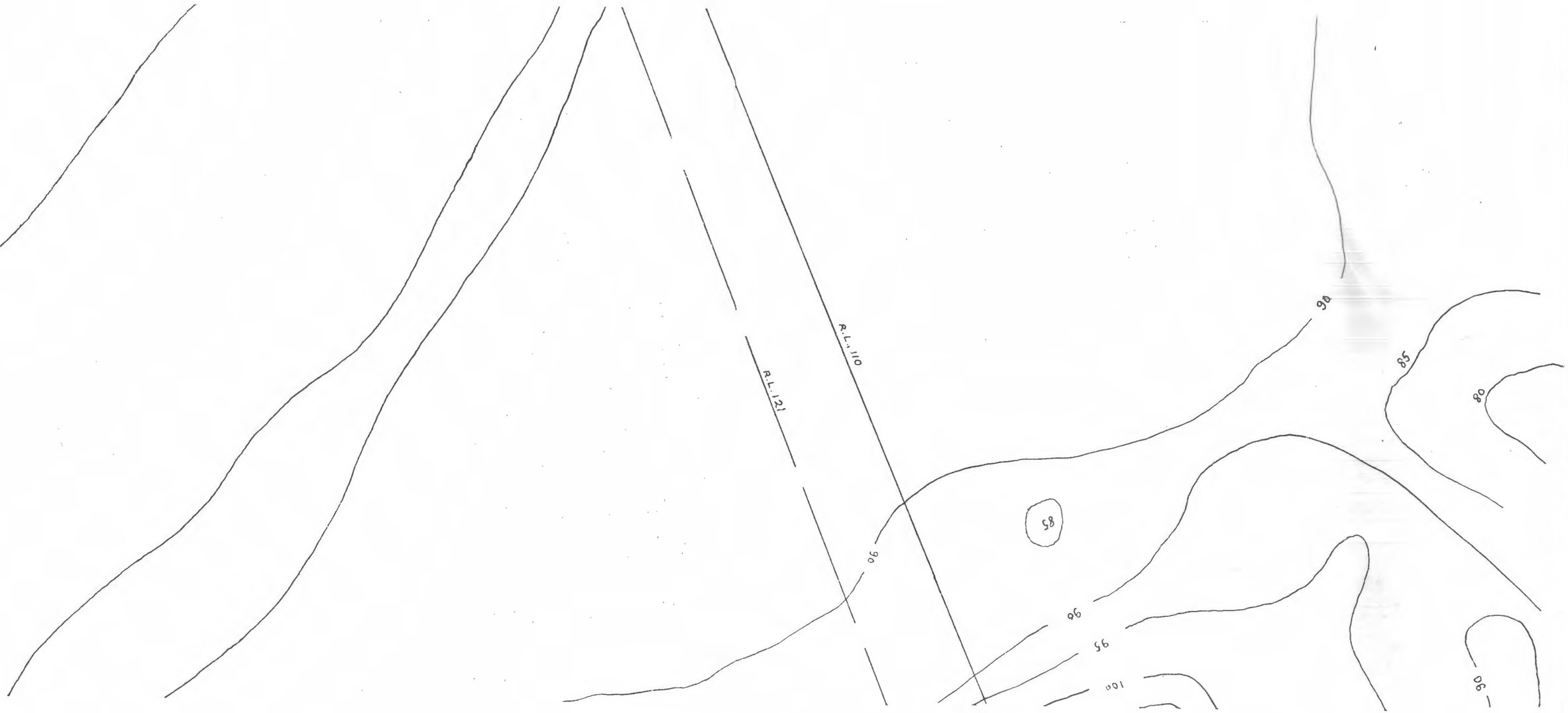


Fig. 1. Secteur B. (Scale : 1/1.900).

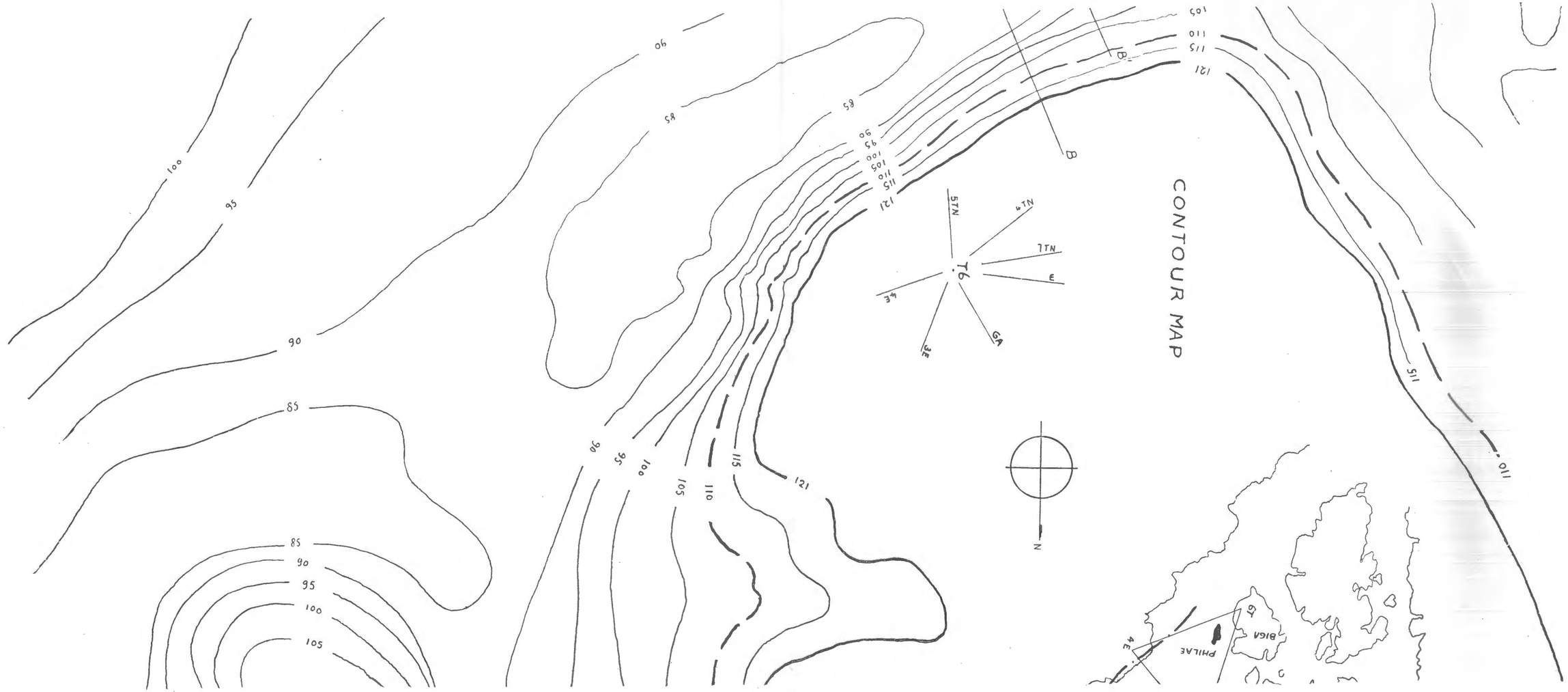


Fig. 1. Secteur C. (Scale : 1/1.900).

Fig. 1. Secteur D. (Scale : 1/1.900.)

Fig. 1. Secteur E. (Scale : 1/1.900.)

Fig. 1. Secteur F. (Scale : 1/1.900.)

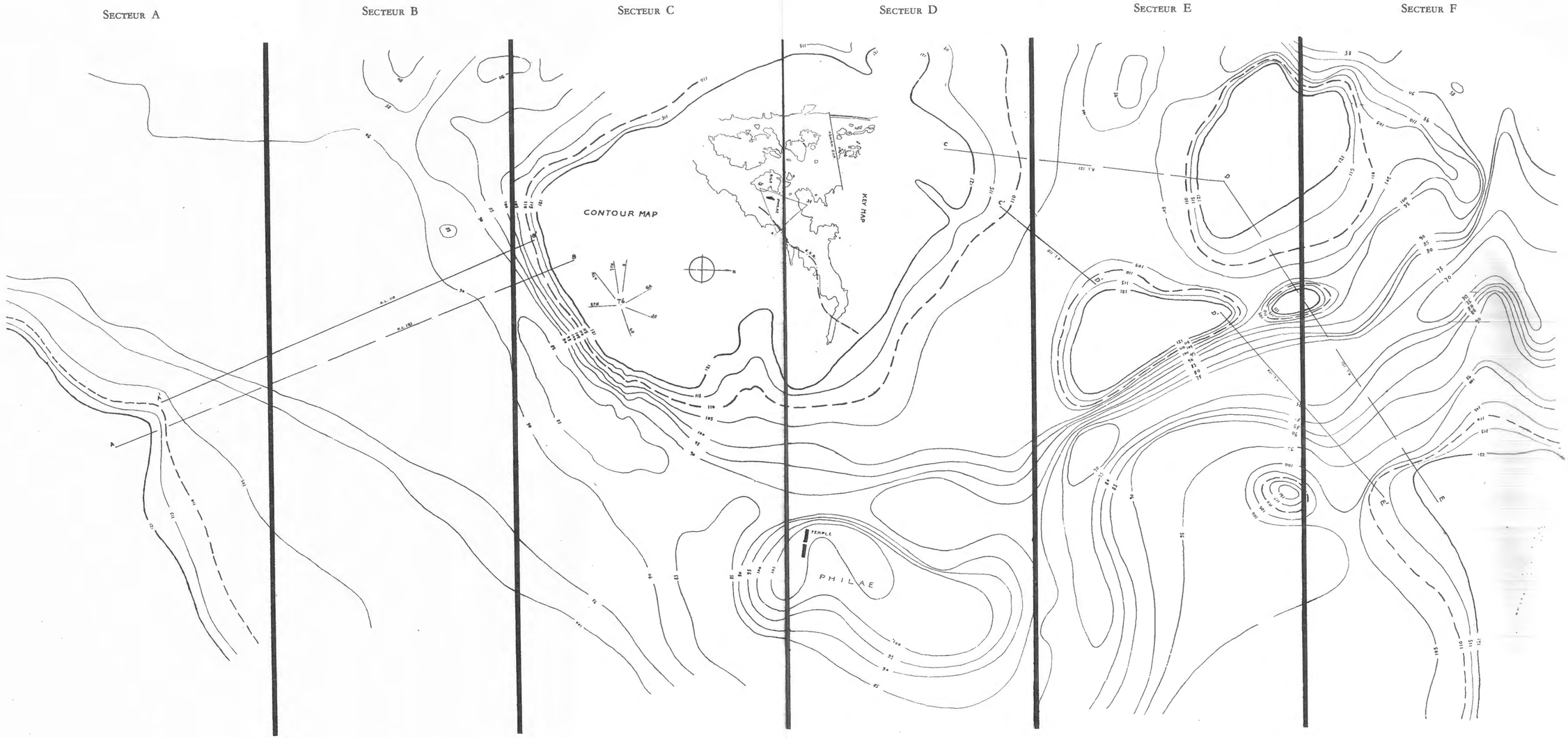


FIG. 1. Contour map, showing bed of the Nile. (Contour map : Scale 1/4.500; Key map : Scale 1/90.000.)

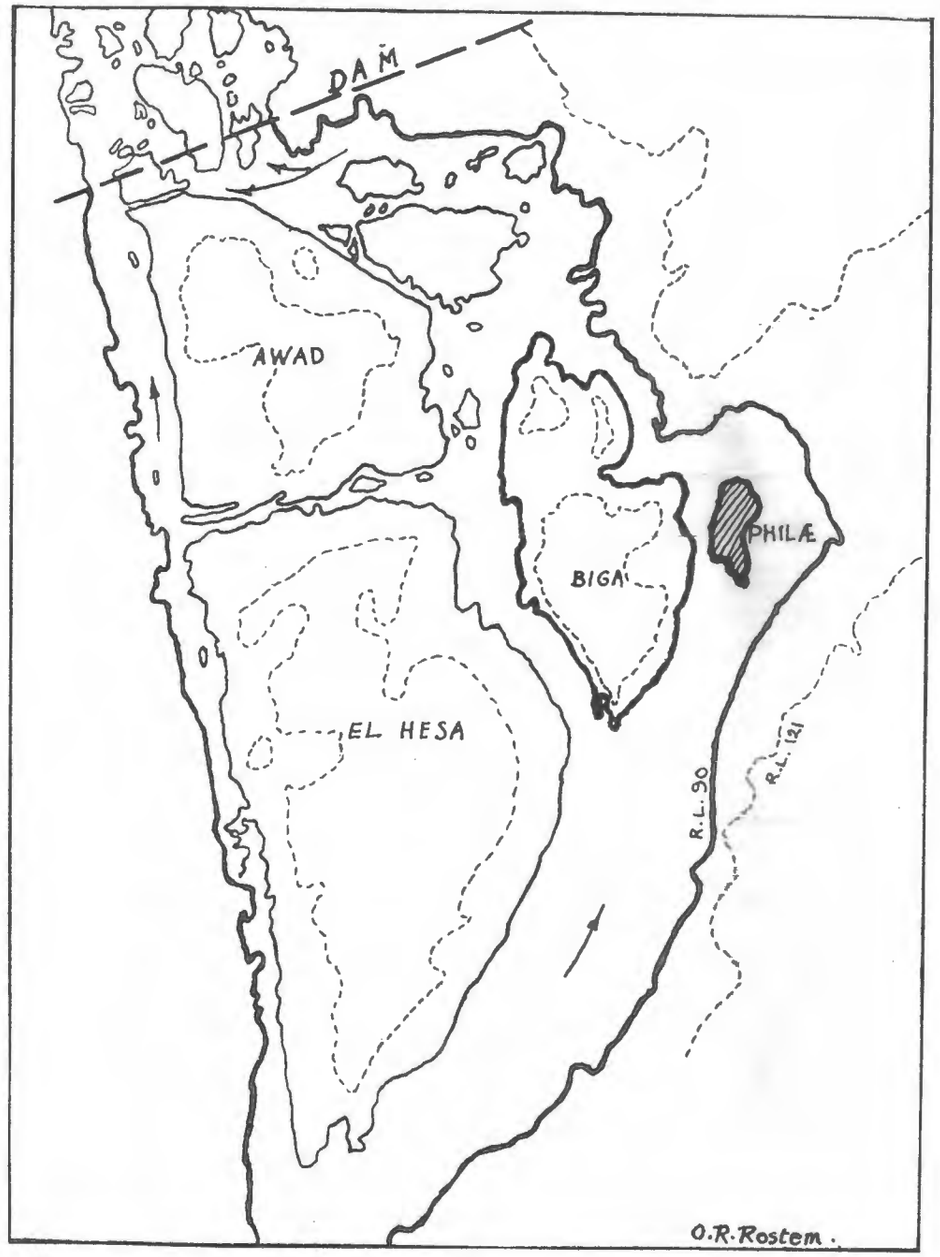


Fig. 2. Site of Philae before building the Aswan Dam.

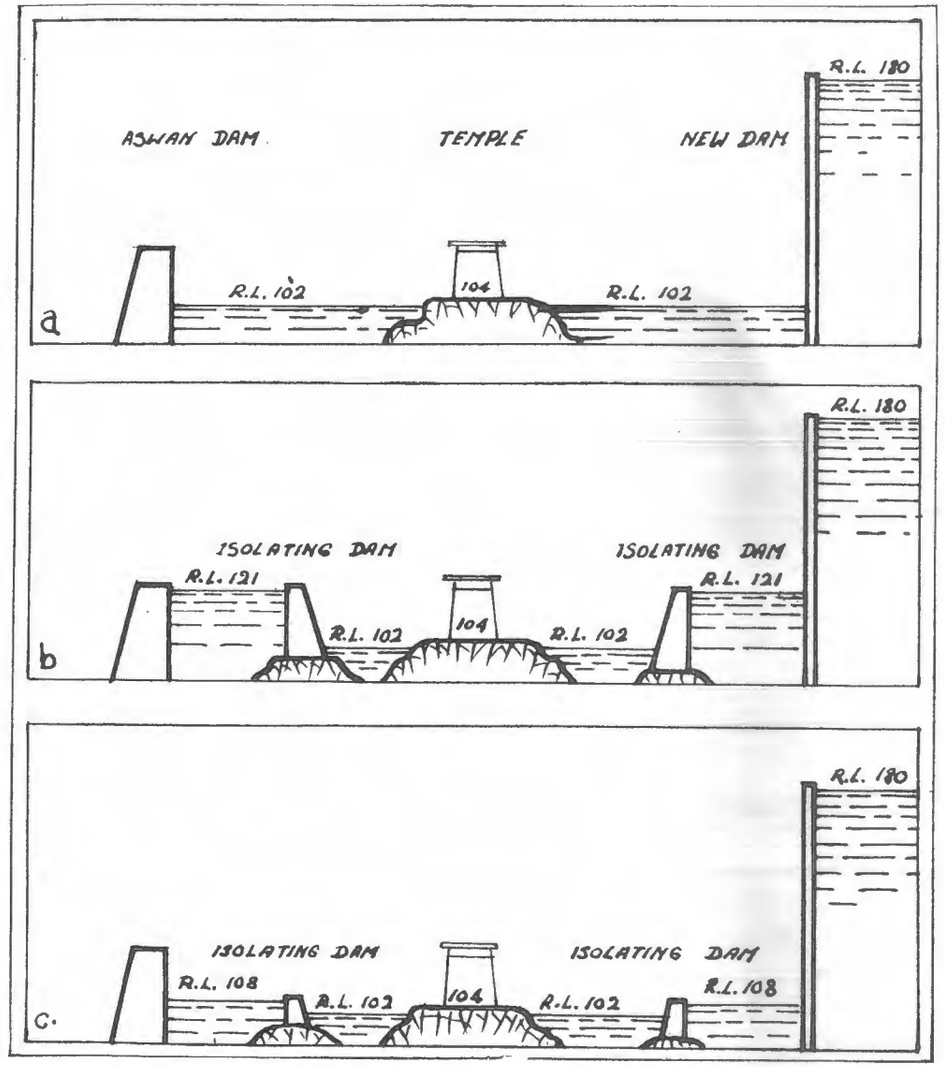


Fig. 3. Diagrams showing comparative heights in the three cases : no submersion, complete submersion and partial submersion.

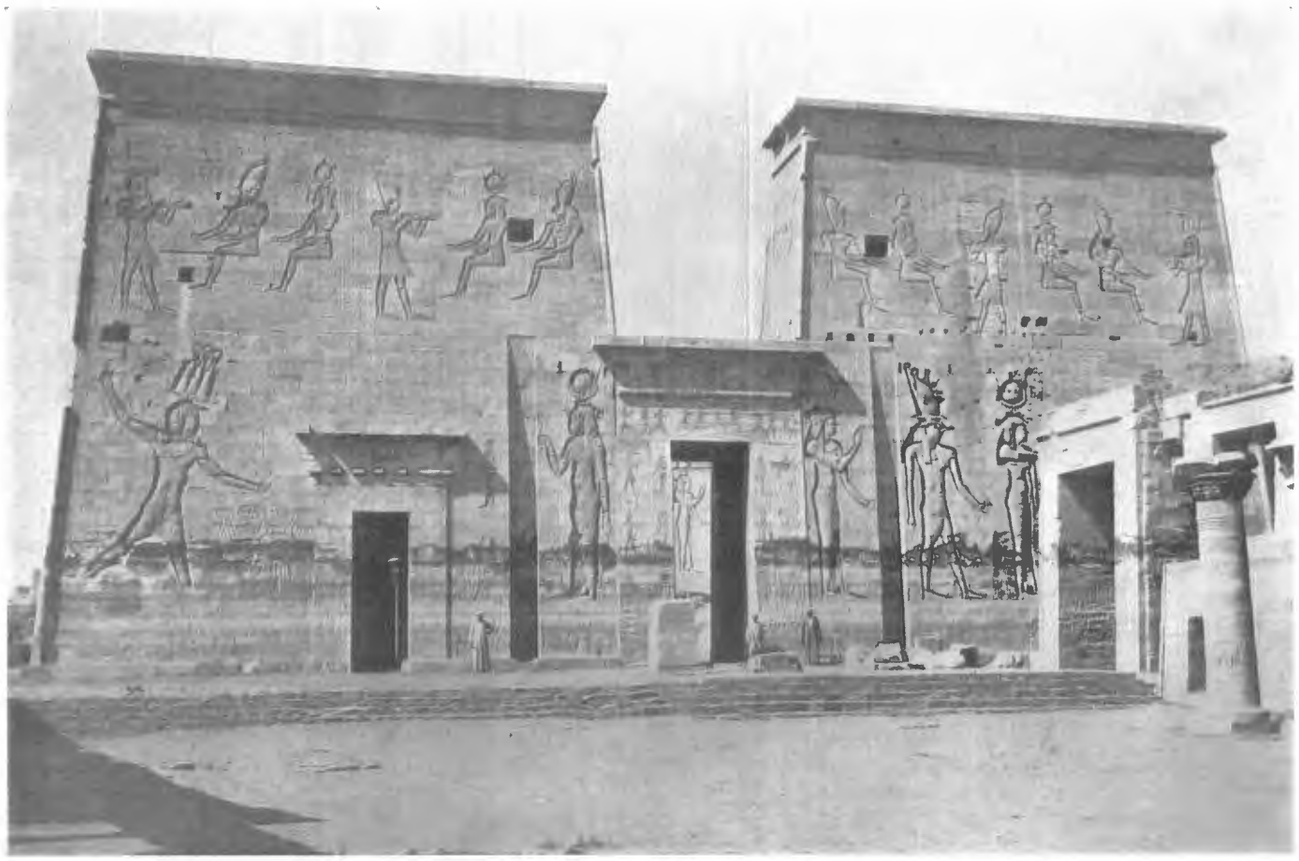


Fig. 4. The Pylon of the Temple, showing the effect of partial submersion.

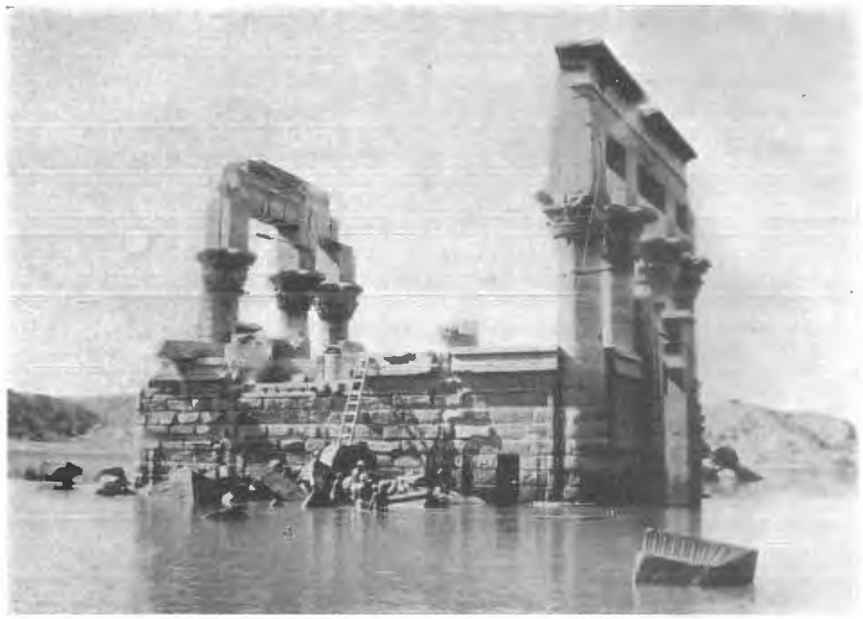


Fig. 5. The Kiosk of Trajan—damaged by a storm in 1944.
It was restored to its original state in 1947.

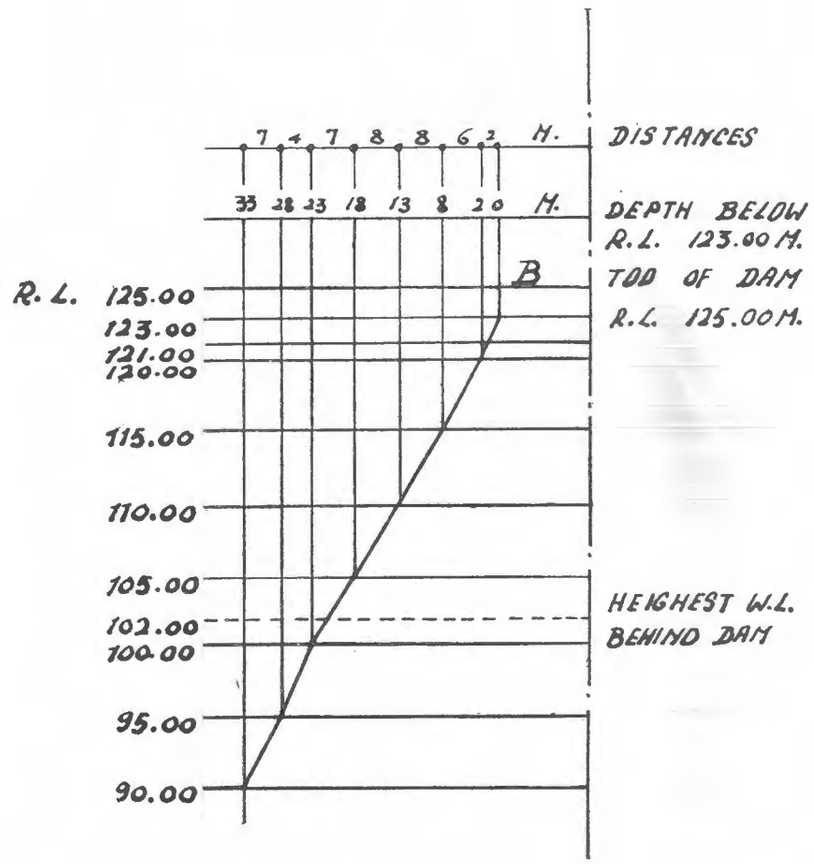
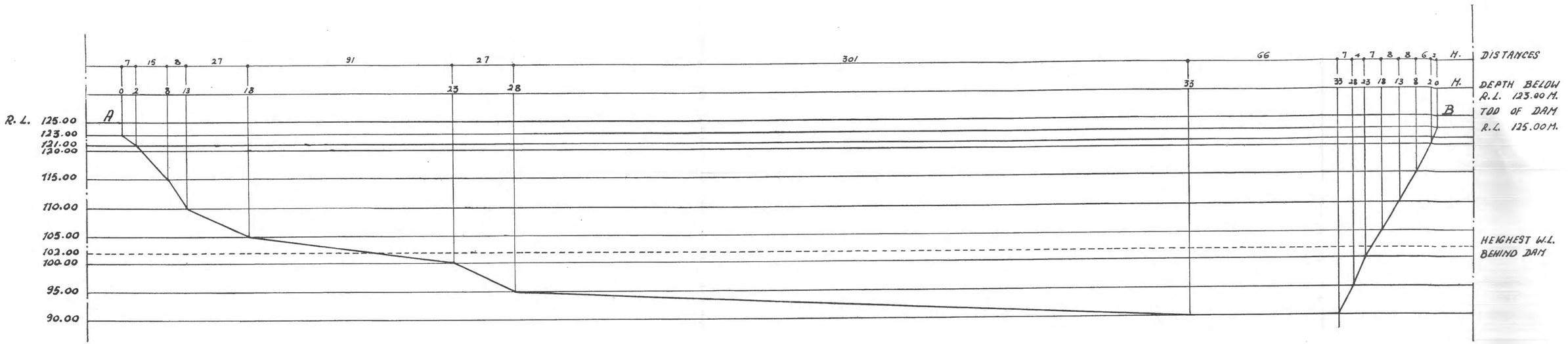


Fig. 6. Longitudinal Sections of Dams (complete submersion).



LONG. SECTION A_B

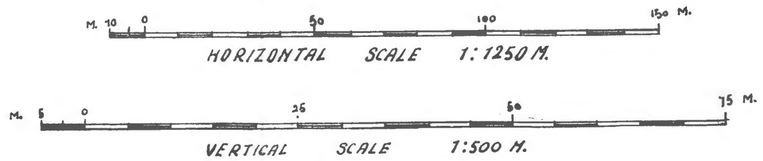
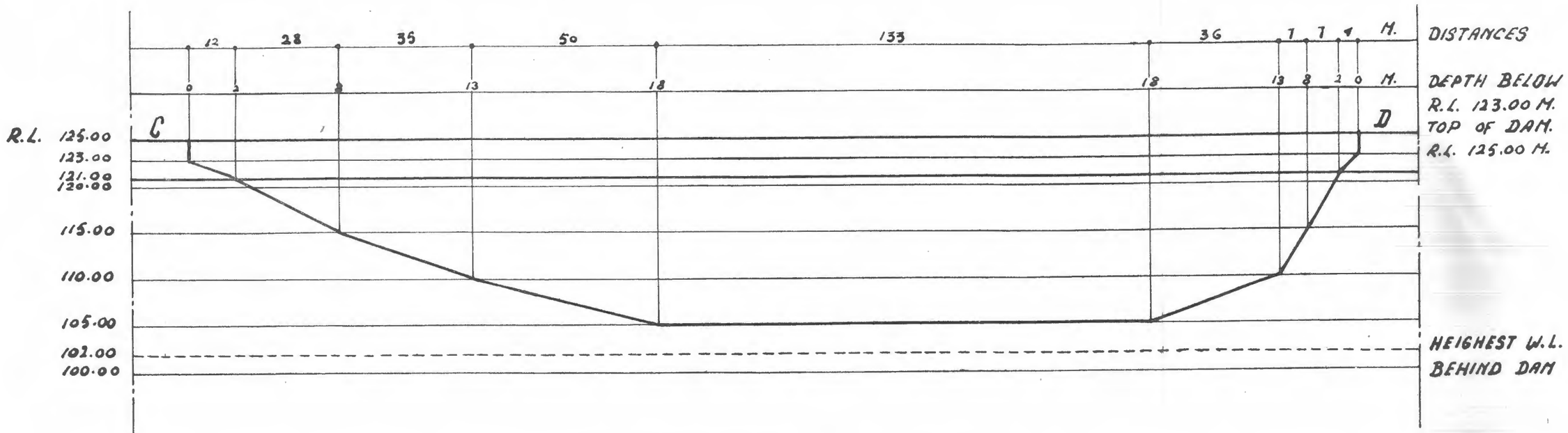


Fig. 6. Longitudinal Sections of Dams (complete submersion).

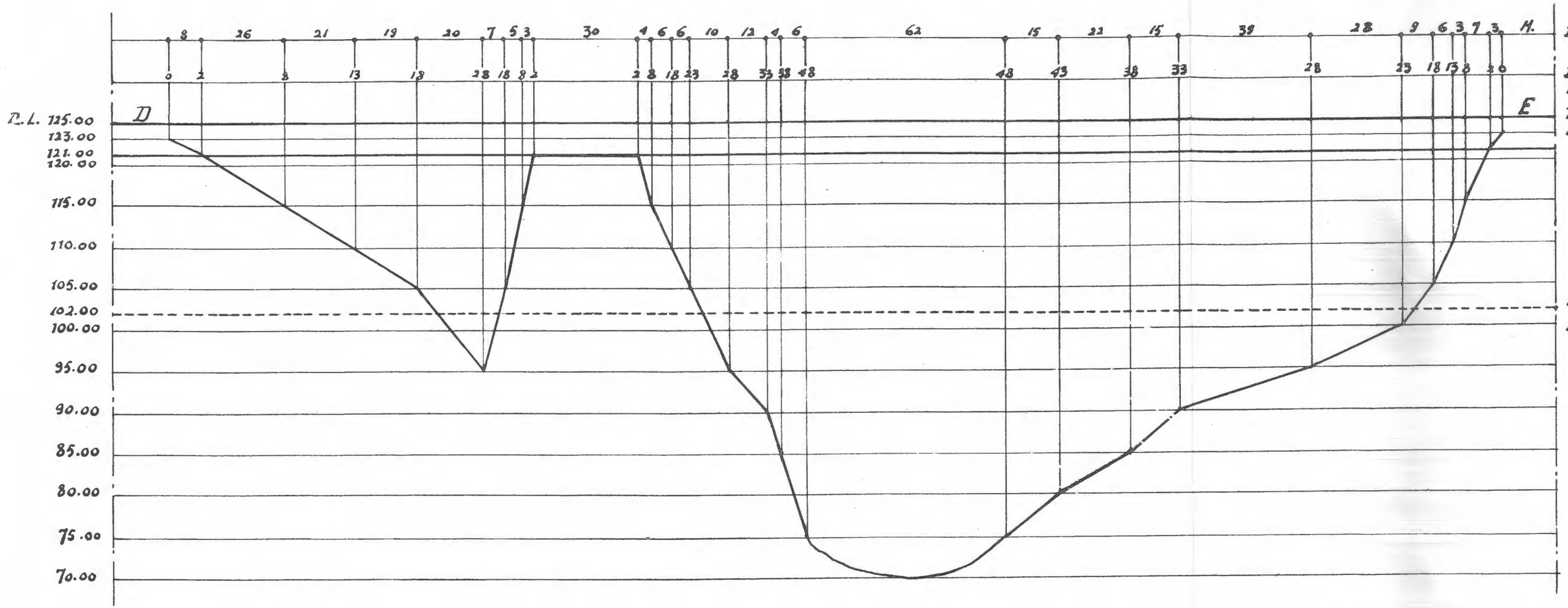


LONG. SECTION C_D

HORISONTAL SCALE 1:1250 M.

VERTICAL SCALE 1:500 M.

Fig. 7. Longitudinal Sections of Dams (complete submersion).



LONG. SECTION D_E

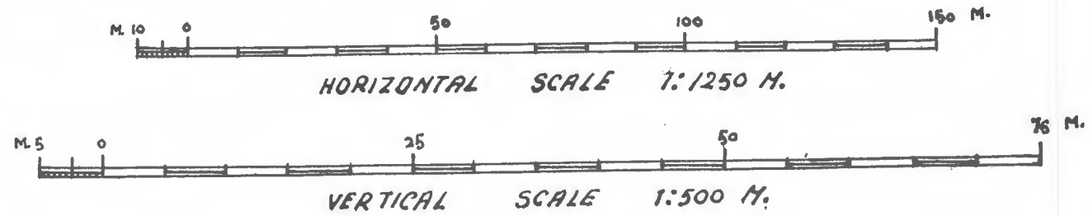
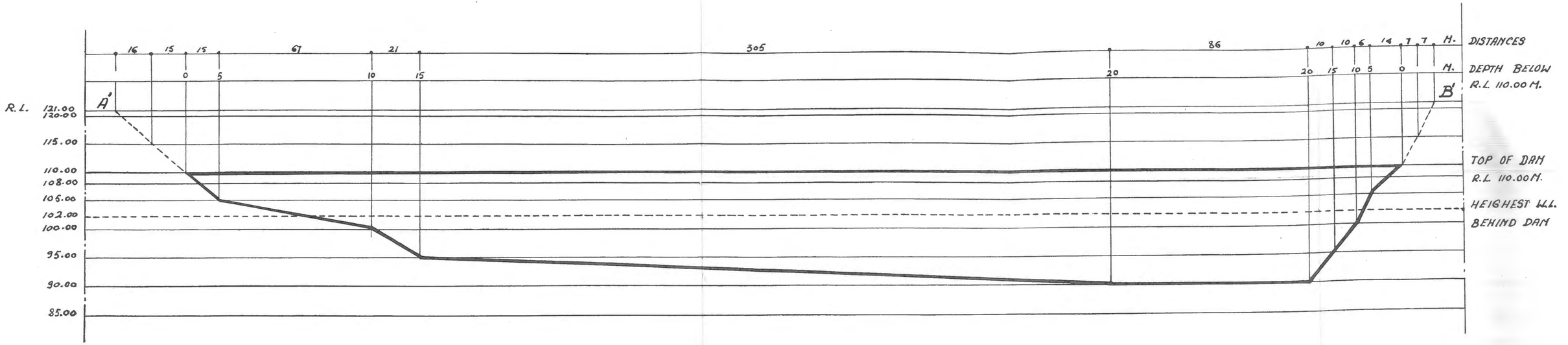


Fig. 8. Longitudinal Sections of Dams (con



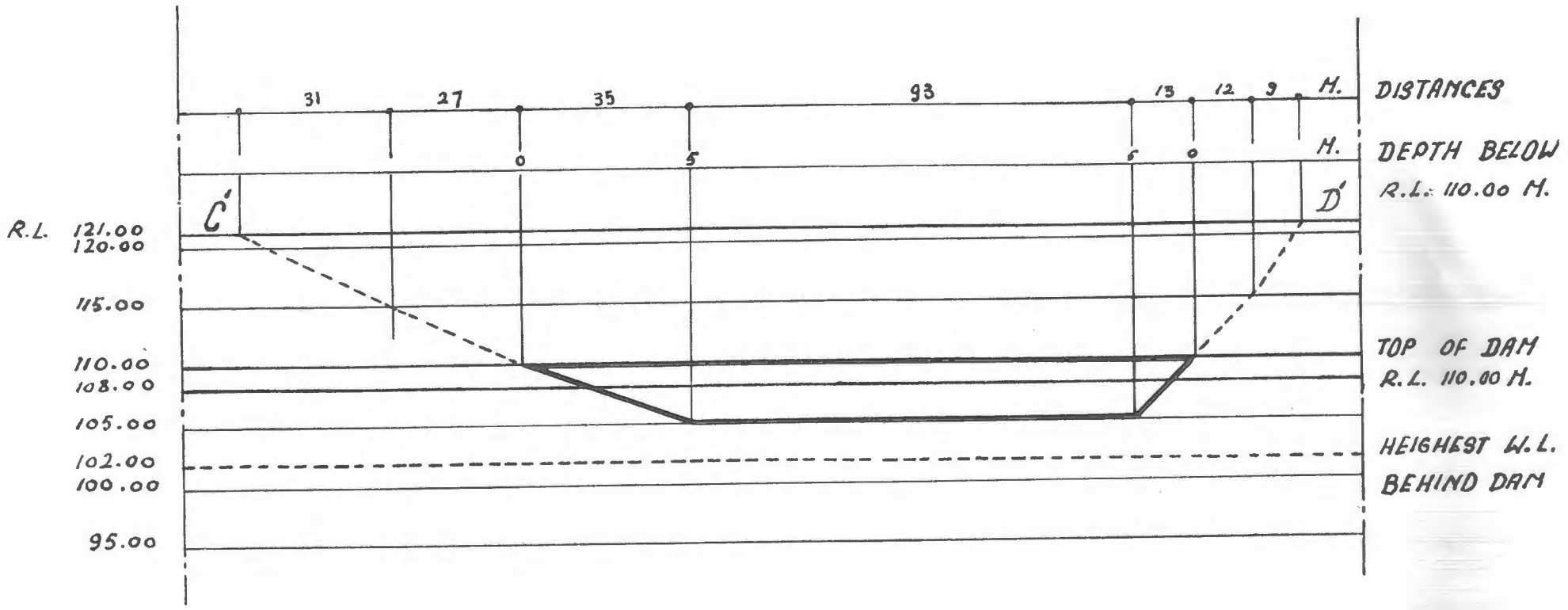
LONG. SECTION Á_B́

Total Lenght of Dam 524 M.

HORIZONTAL SCALE 1:1250 M.

VERTICAL SCALE 1:500 M.

Fig. 9. Longitudinal Sections of Dams (partial submersion).



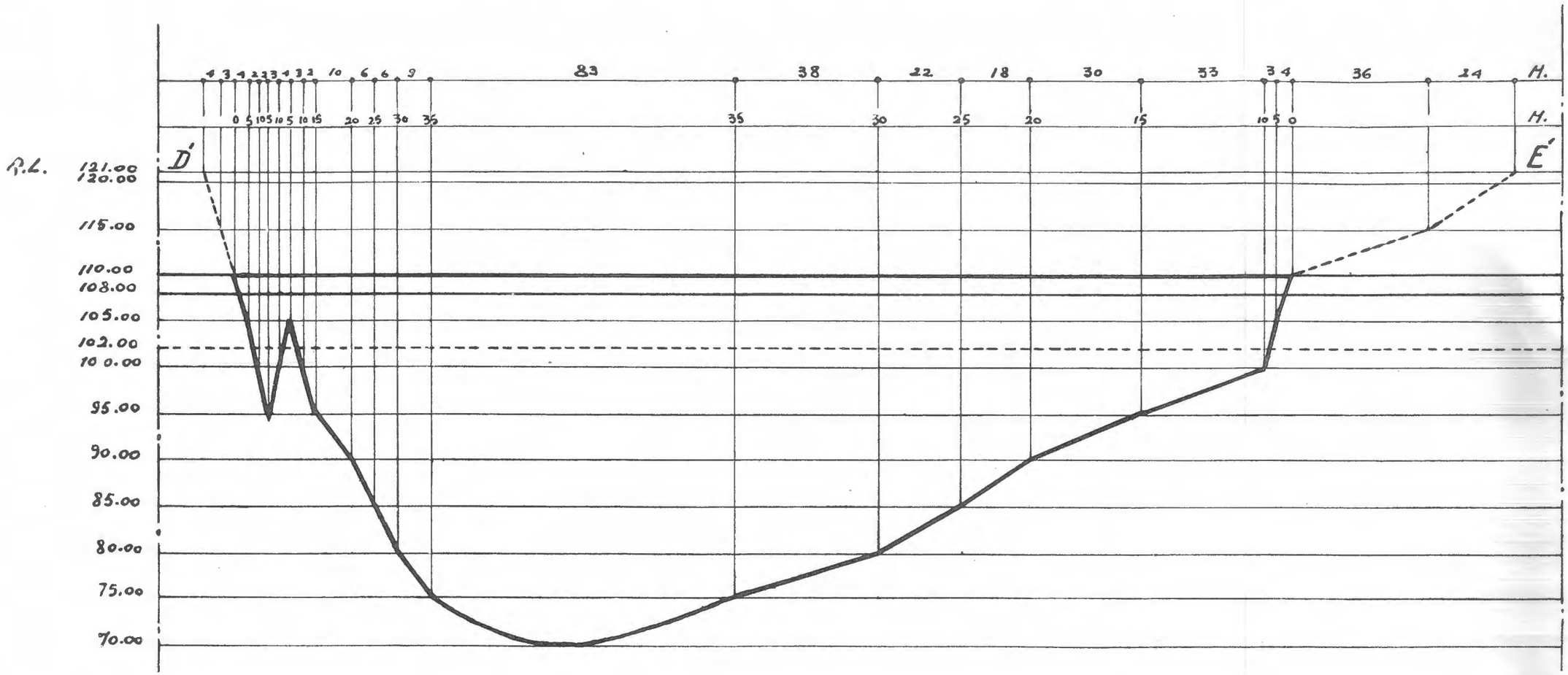
LONG SECTION C-D

Total Lenght of Dam 151 M.

HORIZONTAL SCALE 1:1250 M.

VERTICAL SCALE 1:500 M.

Fig. 10. Longitudinal Sections of Dams (partial submersion).



LONG. SECTION D-É

Total Lenght of Dam 282 M.

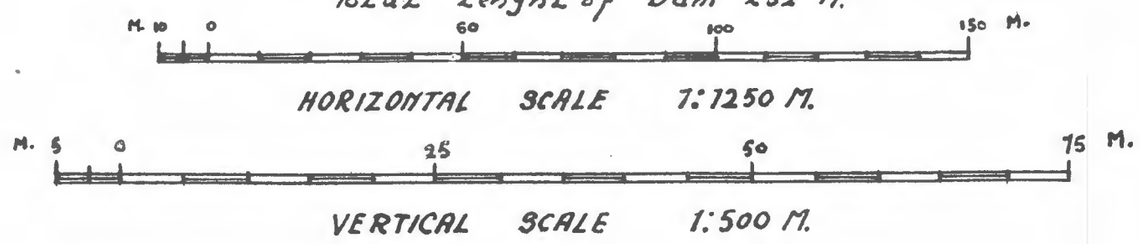


Fig. 11. Longitudinal Sections of Dams (partial submersion)

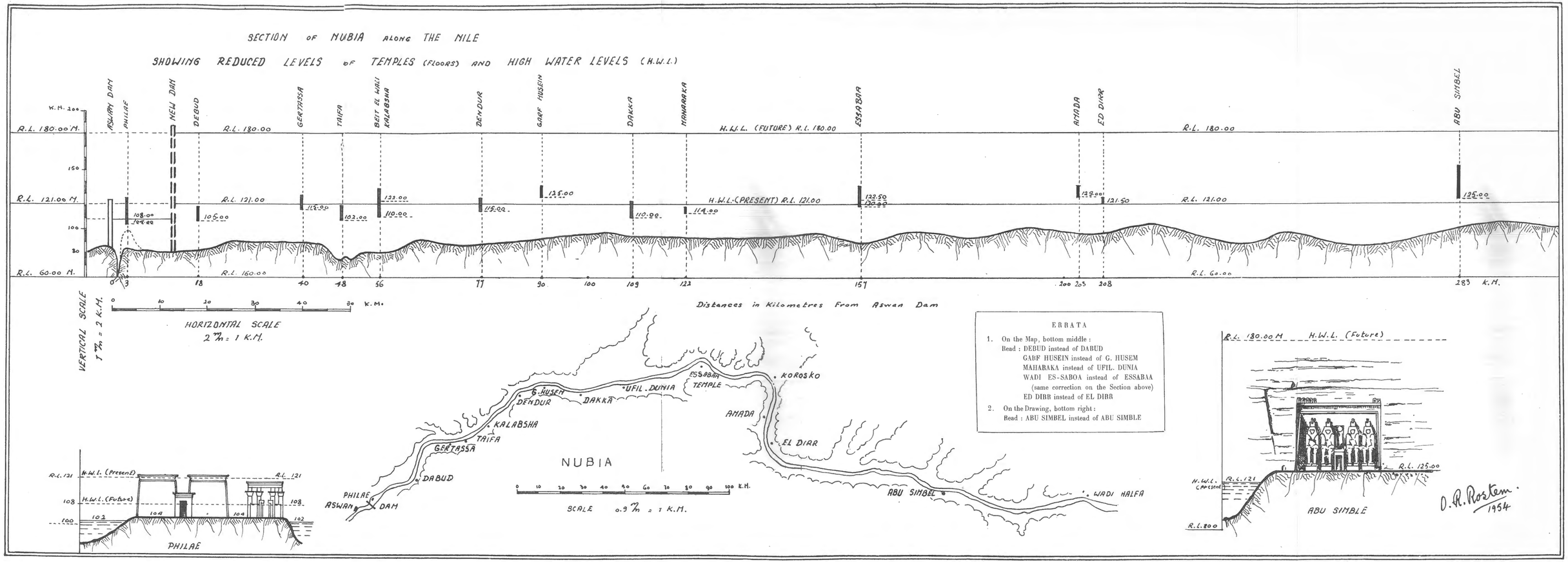


Fig. 12. Section along the Nile, giving levels of the Temples of Nubia and showing Present and Future High Water levels.

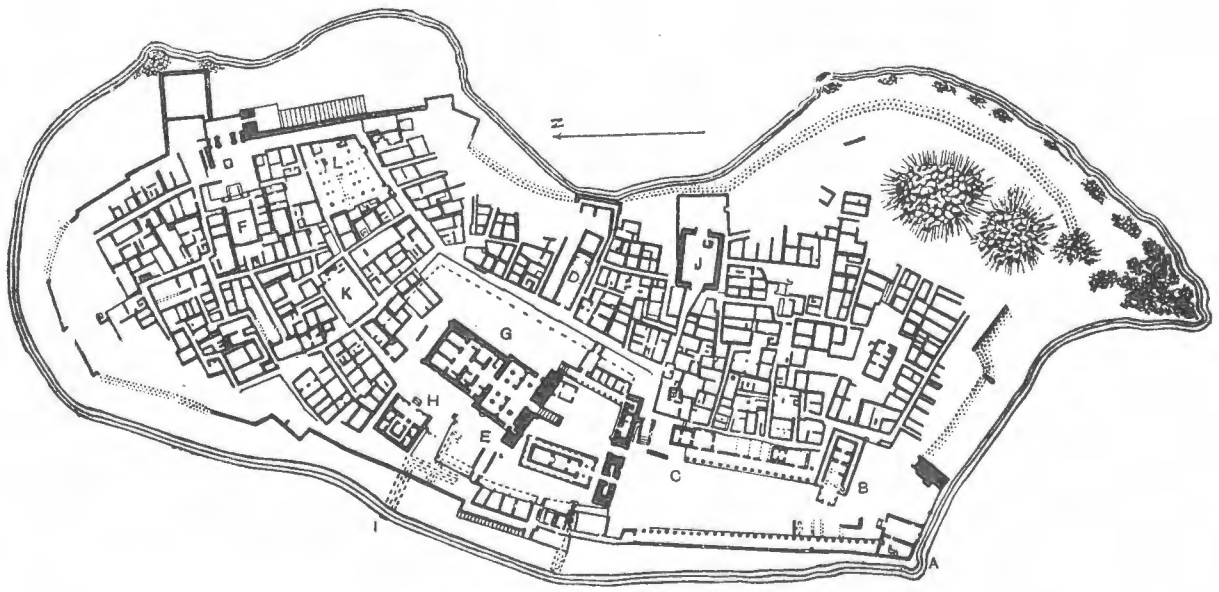


Fig. 13. Plan of the Island.

A Temple of Nectanebus II.
B Temple of Ari-ḥes-nefer.
C Temple of I-em-ḥetep.
D Temple of Hathor.
E Gateway of Hadrian.
F Temple of Cæsar Augustus.
G Temple of Isis.
H Temple of Ḥeru-netch-efet.
I Nilometer.
J The Kiosk.
K. L Coptic church.

Fig. 14. The Nile south of Philae with the proposed Dam added to the same scale.